Write your name here

Surname	Other names

Edexcel GCSE

Centre Number	Candidate Number

Biology/Additional Science

Unit B2: The Components of Life

Foundation Tier

Monday 5 November 2012 – Morning
Time: 1 hour

Paper Reference
5BI2F/01

You must have:
Calculator, ruler

Total Marks

Instructions

- Use **black** ink or ball-point pen.
- **Fill in the boxes** at the top of this page with your name, centre number and candidate number.
- Answer **all** questions.
- Answer the questions in the spaces provided
  – *there may be more space than you need.*

Information

- The total mark for this paper is 60.
- The marks for **each** question are shown in brackets
  – *use this as a guide as to how much time to spend on each question.*
- Questions labelled with an **asterisk** (*) are ones where the quality of your written communication will be assessed
  – *you should take particular care with your spelling, punctuation and grammar, as well as the clarity of expression, on these questions.*

Advice

- Read each question carefully before you start to answer it.
- Keep an eye on the time.
- Try to answer every question.
- Check your answers if you have time at the end.

Turn over ▶

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P 4 1 7 5 2 A 0 1 1 6

PEARSON

Answer ALL questions

Some questions must be answered with a cross in a box ☒.
If you change your mind about an answer, put a line through the box ☒ and then mark your new answer with a cross ☒.

Mitosis

1 (a) Use words from the box to complete the sentences.

(3)

chromosomes		cytoplasm	diploid
haploid	nucleus	carbohydrate	gametes

When a human body cell divides by mitosis, two ..... body cells are produced.

Each of the cells produced contain identical sets of ..... in their ..... .

(b) Complete the sentence by putting a cross (☒) in the box next to your answer.

Mitosis occurs during

(1)

☒ **A** digestion

☒ **B** fertilisation

☒ **C** growth

☒ **D** respiration

(c) Embryonic stem cells divide by mitosis.

(i) Explain why embryonic stem cells are useful in medical research.

(2)

.....

.....

.....

.....

(ii) Each stem cell divides once every 30 minutes.

Calculate how many minutes it would take one stem cell to form sixteen cells.

(2)

answer = ... minutes

(d) Complete the sentence by putting a cross (☒) in the box next to your answer.

Organisms that are genetically identical to each other are called

(1)

☒ **A** cells

☒ **B** clones

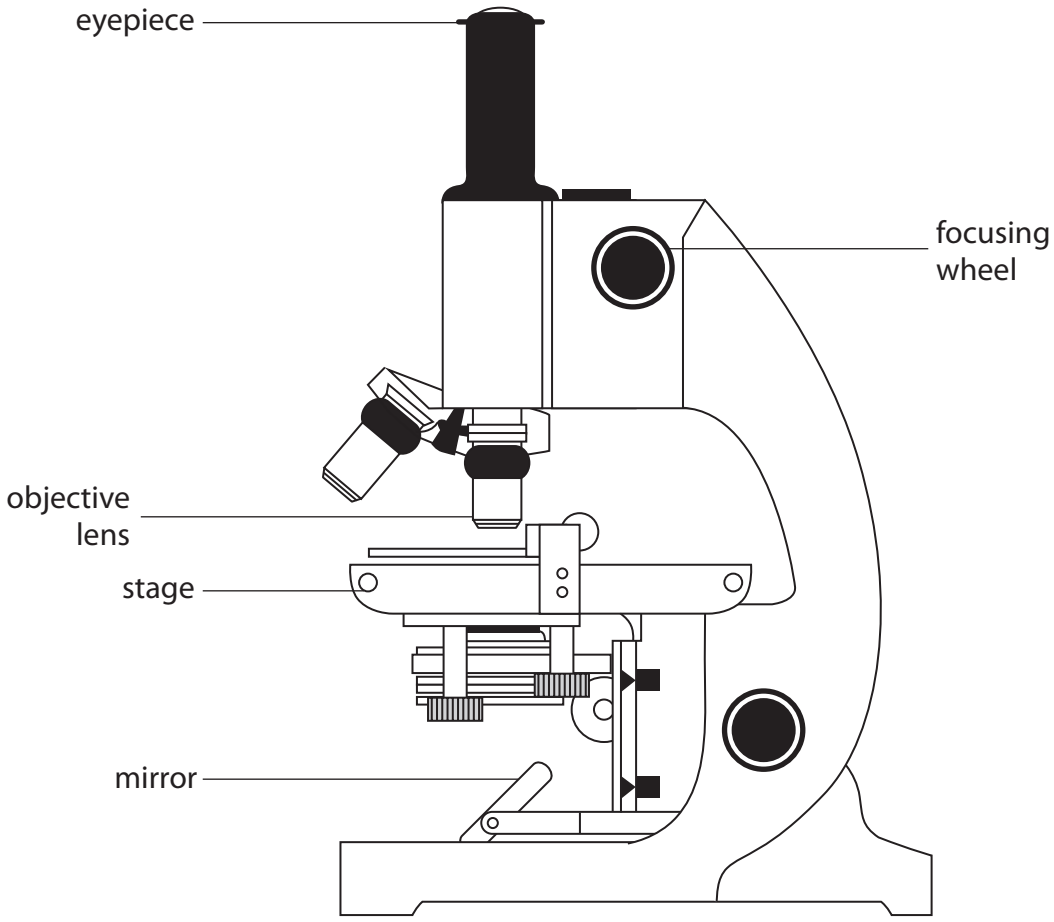
☒ **C** gametes

☒ **D** zygotes

(Total for Question 1 = 9 marks)

Magnifying cells

2 (a) The diagram shows a light microscope.



(i) Complete the sentence by putting a cross (☒) in the box next to your answer.

The focusing wheel is used to

(1)

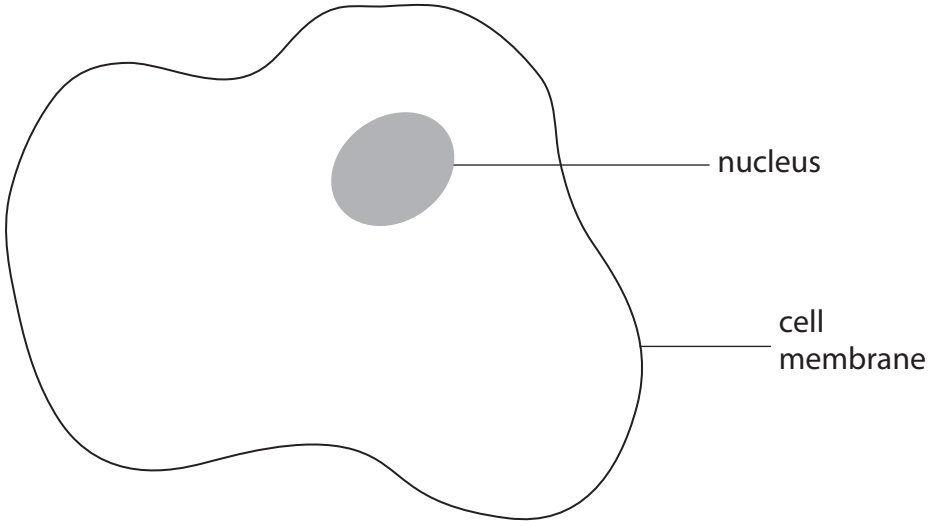
☒ **A** decrease the magnification

☒ **B** increase the amount of light

☒ **C** move the slide on the stage

☒ **D** produce a clear, detailed image

(ii) The diagram shows an animal cell as seen using a light microscope.



not to scale

The length of this cell before it is magnified is 0.005 mm.

Calculate the length of the image after it has been magnified x400.

(2)

answer = ... mm

(b) An electron microscope can be used to see mitochondria inside cells.

State the function of mitochondria in a cell.

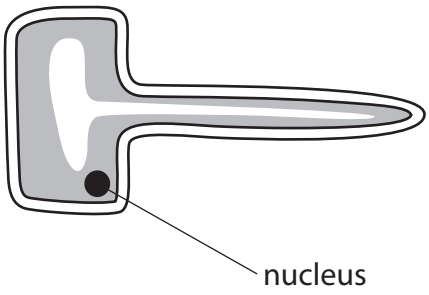
(1)

.....

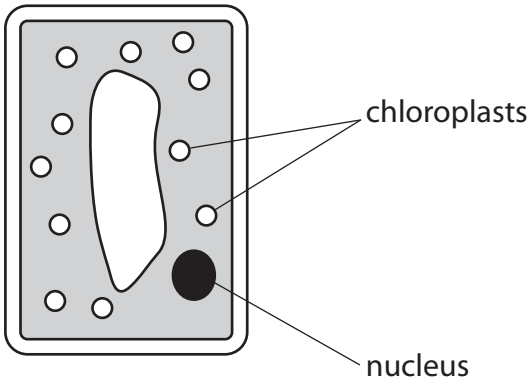
.....

(c) The diagrams show two cells taken from a plant.

a root hair cell



a leaf cell



(i) Complete the sentence by putting a cross (☒) in the box next to your answer.

Root hair cells take in water by

(1)

☒ **A** active transport

☒ **B** osmosis

☒ **C** respiration

☒ **D** transpiration

(ii) Describe the function of the chloroplasts in a leaf cell.

(2)

.....

.....

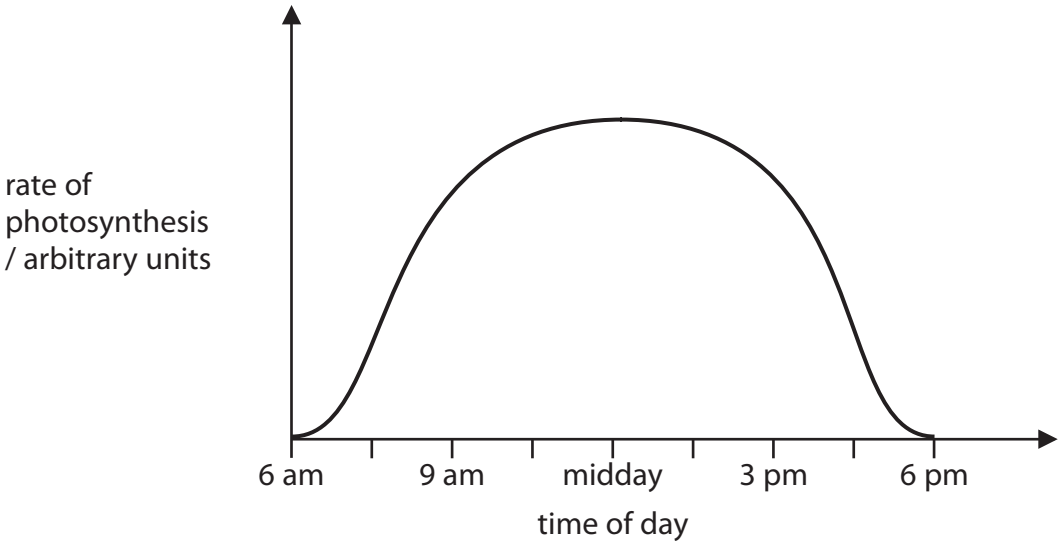
.....

.....

(Total for Question 2 = 7 marks)

Grass plants

3 (a) The graph shows the rate of photosynthesis in a field containing grass plants, during a 12 hour period.



(i) Describe the trend shown by the graph from 6 am to 6 pm.

(2)

.....

.....

.....

.....

.....

(ii) Suggest **two** factors that may affect the rate of photosynthesis during this 12 hour period.

(2)

1 .....

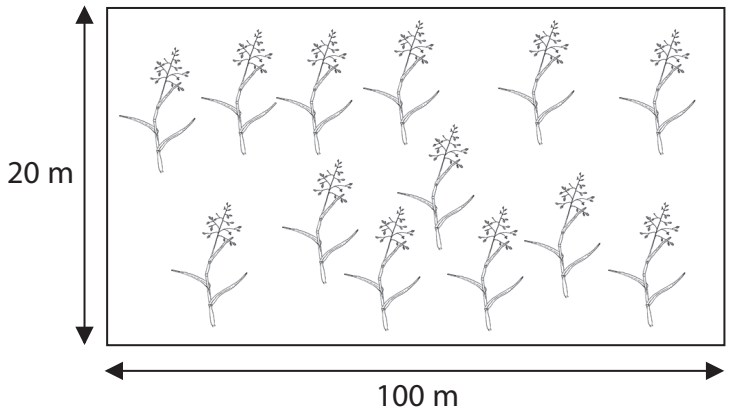
2 .....

(iii) Complete the word equation for photosynthesis.

(2)

..... + water ⟶ glucose + ...

(b) The diagram shows a field containing grass plants.



(i) Calculate the area of the field.

(2)

area of field = ... m^2

(ii) Describe a method that could be used to estimate the total number of grass plants in this field.

(3)

.....

.....

.....

.....

.....

.....

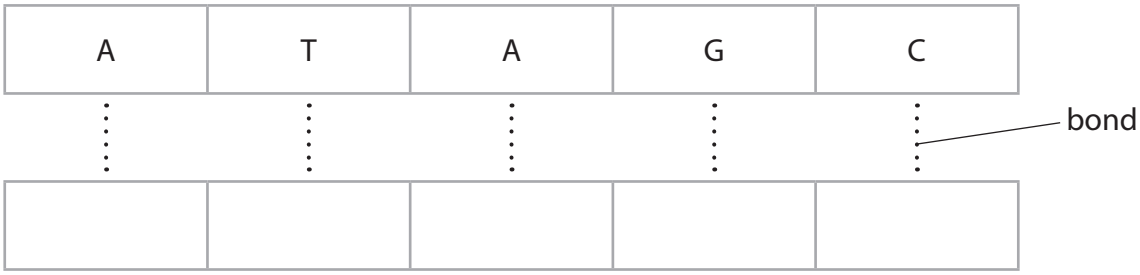
(Total for Question 3 = 11 marks)

DNA

4 (a) The diagram shows part of a DNA molecule.

(i) Complete the diagram by writing the letters of the missing bases in the empty boxes.

(2)

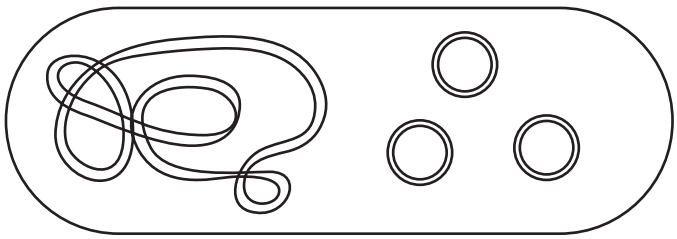


(ii) Name the type of bond that joins the base pairs together.

(1)

.....

(b) The diagram shows DNA in a bacterial cell.



(i) Name the **two** types of DNA found in a bacterial cell.

(2)

1 .....

2 .....

(ii) State the function of DNA in cells.

(1)

.....

.....

(c) Explain how a gene mutation can affect the structure of a protein.

(3)

.....

.....

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.....

.....

.....

(Total for Question 4 = 9 marks)

The circulatory system

5 (a) (i) State the type of blood vessel that carries blood to the heart.

(1)

.....

(ii) Explain how blood is prevented from flowing backwards in the heart.

(2)

.....

.....

.....

.....

(b) Suggest why the heart can be referred to as a 'double-pump'.

(2)

.....

.....

.....

.....

*(c) Explain why heart rate and breathing rate increase during exercise.

(6)

(d) Complete the sentence by putting a cross (☒) in the box next to your answer.

The substance produced during anaerobic respiration is

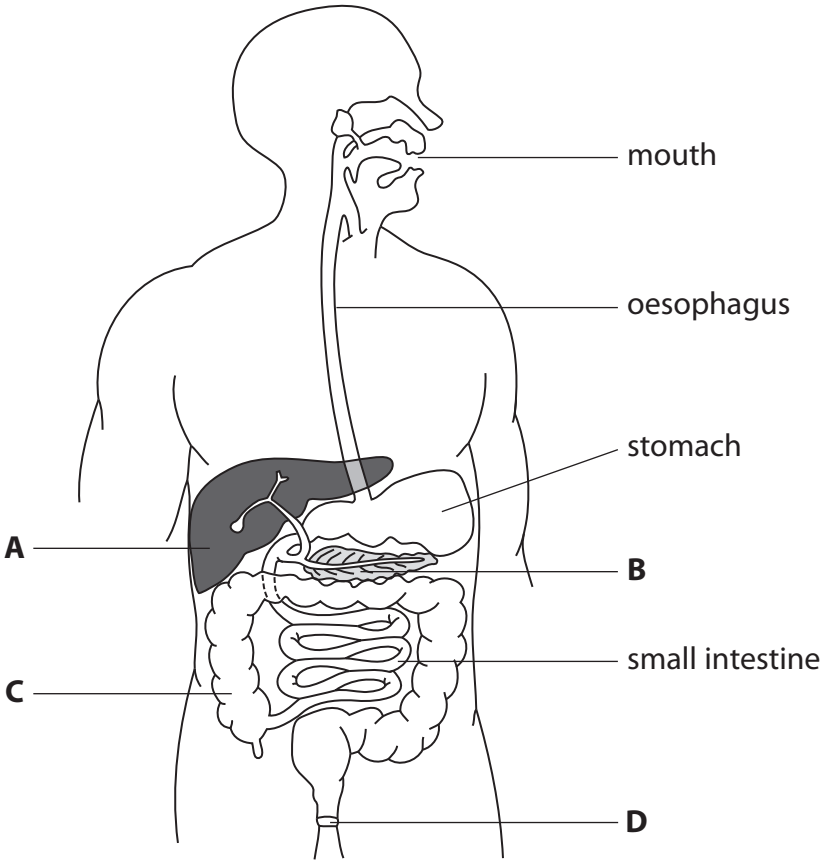
(1)

- ☒ **A** glucose
- ☒ **B** lactic acid
- ☒ **C** oxygen
- ☒ **D** water

(Total for Question 5 = 12 marks)

Digestion

6 (a) The diagram shows part of the human digestive system.



(i) Complete the sentence by putting a cross (☒) in the box next to your answer.

The pancreas in the diagram is labelled

(1)

☒ **A**

☒ **B**

☒ **C**

☒ **D**

(ii) Describe the function of the small intestine.

(2)

.....

.....

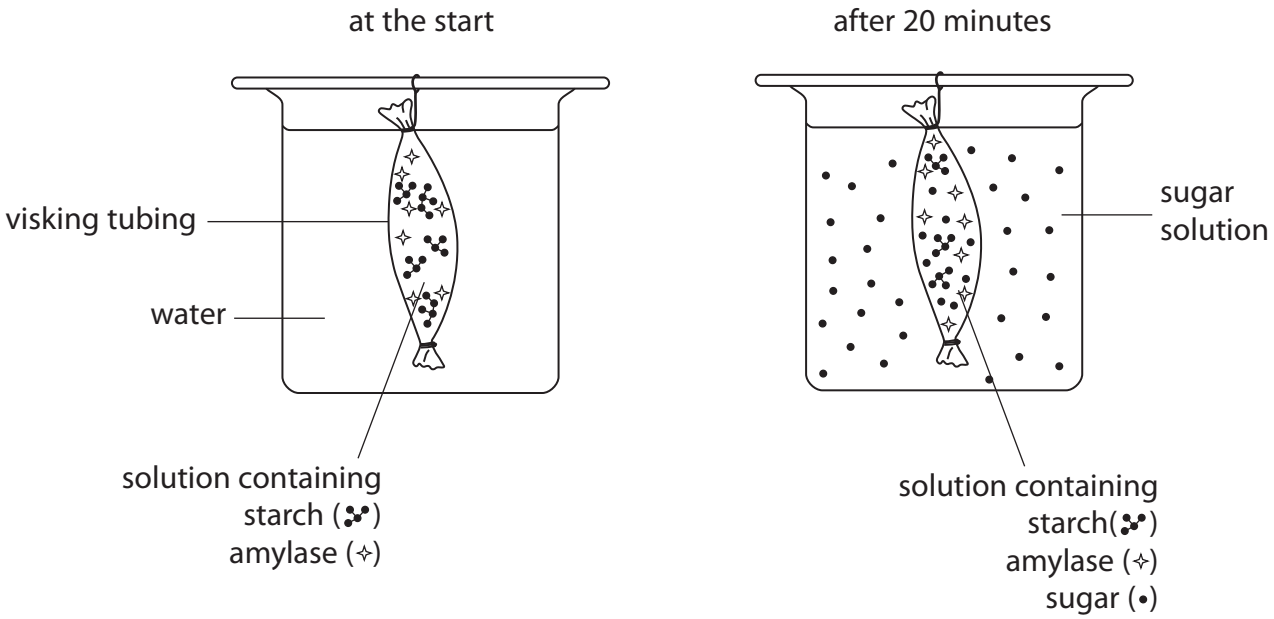
.....

.....

(b) An experiment was set up to find out what happens to food molecules in the small intestine.

Visking tubing was used as a model for the small intestine.

The diagrams show the experiment at the start and the results after 20 minutes.



Explain the results of this experiment.

(3)

*(c) Describe how the action of the mouth, oesophagus and stomach contribute to the digestion of food.

(6)

(Total for Question 6 = 12 marks)

TOTAL FOR PAPER = 60 MARKS

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